

# 5 | *The Expanding City* 1915–50

## ENGINEER COMMISSIONERS

On January 26, 1915, Louis Brownlow—newsman, Woodrow Wilson’s protégé, and future leader in American city management—walked with Engineer Commissioner Major Charles W. Kutz to the boardroom of the District Building. There Brownlow was sworn in as a commissioner. Already a friend of Kutz’s—the two were members of a group of reporters and public servants dubbed the “Doughnut Cabinet” who met daily for lunch at the Willard Hotel’s grillroom—Brownlow began to learn the art of government in the months that followed.

*At the same time I was learning a great deal about administration from a master of the art, Majr. Kutz. He didn’t lecture me. He didn’t tell me directly that I had put my decisions and recommendations on too narrow a base. He didn’t reprove me for my impetuosity.... He didn’t tell me directly that there were some things I ought to look into more carefully and think about longer before I reached my final conclusions. He didn’t tell me any of these things, but in every board meeting he gave me a lesson by example. For every recommendation he brought in, he was careful to explain the reasons for his determination....When I was too hasty, and I frequently was, Kutz*

**OPPOSITE PAGE: ARLINGTON MEMORIAL  
BRIDGE CONSTRUCTION**

*Photo credit: Library of Congress, Prints and  
Photographs Division, LC-H824-T-321*

*sometimes would ask a question, always phrased in tentative form and always asked quietly.*

*As the months went on, it became more and more my habit, when issues were complex, to walk into the engineer commissioner's office and ask Kutz what he thought we should do.*

*Thus it happened that during the first months and the first two years of my actual experience as a public administrator, I found a teacher and a mentor, wise, kindly, and sympathetic, in the person of a then major of the Corps of Engineers of the United States Army, a graduate of West Point, a military man with a military mind, who still never permitted for an instant the rigidity of his training to overcome the flexibility of his mind and heart.<sup>1</sup>*

Major Kutz became Engineer Commissioner in 1914, but was sent to wartime service when the United States entered World War I. Brigadier General John G. D. Knight came out of retirement to take his place. The commissioners faced a chaotic scene in Washington during the war. The city's population soared 50 percent. General Knight was competing with the war for men and materials to keep the city running. Normal construction was halted, a shutdown of sewerage and garbage service had been narrowly averted, and



**Colonel Charles Willauer Kutz**  
Office of History, Corps of Engineers  
U.S. Army Signal Corps photo

*Charles Willauer Kutz (1870–1951) graduated from West Point in 1893, his first assignments working on fortification and river and harbor work in Baltimore, Maryland, and Portland, Maine, which became his particular area of expertise. Between 1903 and 1906 Kutz served as an assistant to the Chief of Engineers in Washington before spending two years as an instructor at West Point. In 1906 he was assigned to fortification and river and harbor work in Seattle subsequent to being named chief engineer officer of the Department of the Philippines in 1911. Beginning in 1914 Kutz served almost ten years in three separate terms as Washington's Engineer Commissioner, longer than any other incumbent, the first term broken by overseas service during World War I.*

Potomac River pollution was on the increase. Thousands of new mouths drank city water, and Knight refused to estimate per capita consumption, since nobody knew any longer how many people were in Washington.<sup>2</sup>

Embroided in a struggle to force rate schedules upon district utilities, Brownlow persuaded Secretary of War Newton D. Baker to secure Kutz's appointment to a second term as a District Commissioner when the war was over. "I shall never forget," said Brownlow, recalling a day in 1918, "the concerned, puzzled, and frustrated look on the face of one of the presidents of the utilities when he came into my office later that afternoon and I told him that Kutz would be back." Together Brownlow and Kutz forced exceptionally low rates on the utilities. Brownlow (a Democrat), whose father-in-law Representative Thetus W. Sims had been a member of the House Committee on the District of Columbia, was himself intensely interested in politics. Kutz, he recalled, "had not shared the partisan political approach to affairs toward which so many of us...were inclined. I was astonished when he disclosed to me that he had some misgivings about my attitude, that he was somewhat alarmed that I would violate the integrity of the District service by going too far in my partisan activities."<sup>3</sup>

The most significant achievement during Kutz's second term as Engineer Commissioner was a comprehensive zoning plan for Washington that passed Congress in 1920. Washington was the second American city to institute such an integrated plan. Working with St. Louis planner Harland Bartholomew (1889–1989), the commissioners prepared three basic maps that showed the location of every building in the city. "One [was] for the control of property uses, another to control the height of buildings, and the third to limit the area of the lot on which buildings could be built." Using these maps Bartholomew and the commissioners studied land-use data and recommended the separation of residential, commercial, and industrial uses, each with its specific regulation for height, use, and area of buildings to be erected.<sup>4</sup>

Controls on use seemed a startling violation of property rights, and Kutz and Brownlow decided to "do everything possible to take the community fully into our confidence and to enlist the help of the citizens generally." The maps were produced by the hundreds, and maps in hand, "General Kutz spent two hours each morning traversing every street in the areas that we were supposed to take up the next day." Before they made their recommendations, the commissioners had walked every street and roadway in the district to determine the appropriate use for every square and neighborhood, addressed citizens' meetings, and met with their staff after 11:00 p.m. In his final report, Bartholomew recommended

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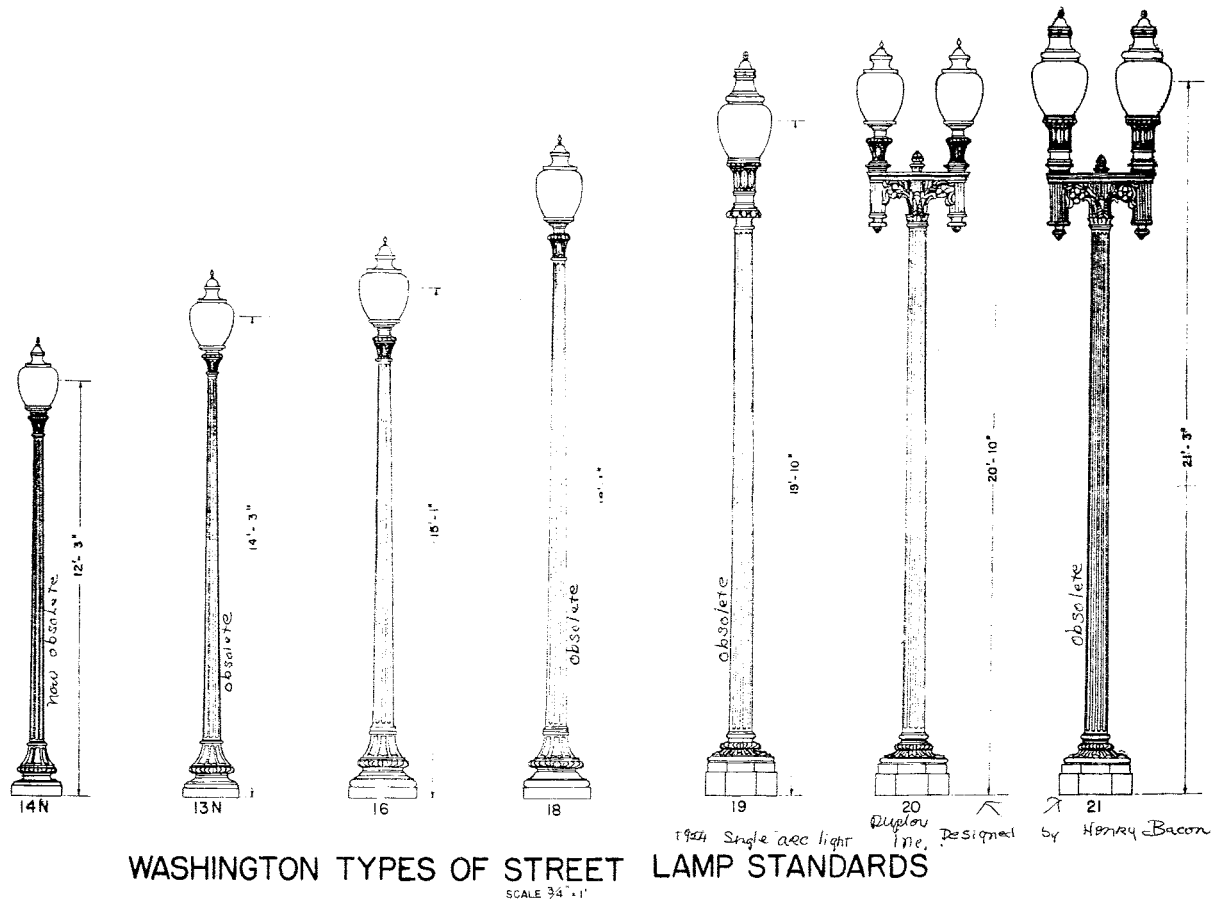
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*"[H]e was somewhat alarmed that I would violate the integrity of the District service by going too far in my partisan activities."*

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APPROVED *Walter E. Bell*  
ELECTRICAL ENGINEER, D.C.  
DATE August 8, 1934.

ELECTRICAL DEPARTMENT, D.C.

*Sketch of standard street lamp posts for Washington, 1934, compiled by Engineer Commissioner Bell; the tallest and most elaborate was designed by Henry Bacon, architect of the Lincoln Memorial. Office of the Engineer Commissioner*

a commission be created to coordinate zoning with the city's future growth; in 1926 such a commission was established with the Engineer Commissioner at its head.<sup>5</sup>

Under Kutz's chairmanship of the District Zoning Commission, and with advice from the Board of Trade, a city-wide plan took form. Pressure from developers to zone for apartment buildings in the residential area west of Rock Creek Park came to nothing when surveys showed that ample multiple-unit buildings existed elsewhere in the city. When final regulations were adopted on August 30, 1920, Kutz noted that the law marked "a far-reaching step in the advancement of the National Capital...[for]...its symmetrical and beautiful development." Brownlow saw the process as responsive to district citizens who did not choose their local government. "I doubt very much whether any city in the country where the normal electoral processes go on and where the heads of the city government are elected by the people ever undertook such an intensive program for inducing citizen participation or such careful consideration of citizen suggestions."<sup>6</sup>

Although regulating costs of utilities and accomplishing Washington's zoning plan were major achievements during the first quarter of the twentieth century, the District

Commissioners still continued annually to carry out the city's important municipal services. Extending, paving, and naming streets were a highly visible part of their work as widely dispersed subdivisions increased in upper northwest and far northeast. Lighting these streets also was a major undertaking. In 1910 the Commission of Fine Arts approved for city streets an enclosed arc light with a sectional globe on standard ten- to twelve-foot-tall pillars designed by architect Daniel Burnham for Union Station, although only a limited number were erected and only on downtown streets. In 1923 Engineer Commissioner Major Franklin Bell appointed a Committee on Lighting Needs to prepare a comprehensive street lighting plan. They recommended using gas light exclusively throughout the city with standards sixteen to twenty-one feet tall, the tallest having double globes designed by architect Henry Bacon. In 1967 writer John Dos Passos recalled the romantic atmosphere these lights imparted.<sup>7</sup>

*We walked out southeast toward the Navy Yard. This was still the Washington I remembered: The shadowy streets choked with trees where all the life seemed to be going into vegetation, the street lights shaded and muffled in green leaves,...old women panting in rockers under low-hanging branches, light filtering through the green leaves, the shadows of branches thrown on brick walls....We had come out into the open spaces of trees and grass and shrubbery in front of the Library of Congress before we noticed there was a moon.*<sup>8</sup>

In 1927 now Lieutenant Colonel Bell, who had been appointed Engineer Commissioner in 1923, wrote about his experiences playing such an important role in

(Below left)

*Among their many municipal duties, the Engineer Commissioners oversaw paving and maintenance of the district's streets from 1874 until 1967.*

*Library of Congress, Prints and Photographs Division, LC-USZ62-116217*

(Below right)

*Cleaning Washington's streets and alleys of refuse and winter snow was supervised by the Engineer Commissioners, the most active of the district's three appointed commissioners who ran Washington's municipal government for nearly a century. In the 1930s trucks spraying water were supplemented by uniformed "white wings" who removed debris daily.*

*Washington Society of Engineers*



Washington's municipal life. He cogently explained the complex governance of the city by many different federal agencies but particularly emphasized the professional and personal difficulties he faced while serving as the Engineer Commissioner. For example, he recounts that he was named in sixty-six lawsuits brought by disgruntled citizens who were unhappy with the decisions made by the commissioners. He became wary of social intercourse with many citizens because some people he met expected preferential treatment. Generally, however, Bell was positive about the experience and urged engineers to elect their colleagues to positions in municipal administration because such jobs fully utilized their training and expertise.<sup>9</sup>

#### **OFFICE OF PUBLIC BUILDINGS AND GROUNDS**

While the District Commissioners grappled with a changing city, the Office of Public Buildings and Grounds completed the monumental projects left unfinished at the outbreak of war. In 1913 Congress established a commission to erect a Memorial to Women of the Civil War and appropriated \$400,000 for a building to be used as the headquarters of the American Red Cross, provided \$300,000 in private funds were raised. The International Red Cross was organized in Geneva, Switzerland, in 1863, as a result of Florence Nightingale's work as a nurse during the Crimean War, but the American Red Cross was not founded until 1881 by Civil War nurse Clara Barton. The Red Cross building, designed by Philadelphia architects Trowbridge & Livingston, was one of three major marble buildings for which Colonel Harts supervised construction; its cornerstone was laid on March 27, 1915, by President Woodrow Wilson who also dedicated it on May 12, 1917, before the "first mobilization of uniformed women war workers ever held in the United States." Between 1927 and 1930 a second memorial building, also designed by Trowbridge & Livingston, but supervised by Lieutenant Colonel U. S. Grant III, was added to the complex. It commemorated the services of American women in World War I. The Red Cross's third office building, designed by Trowbridge & Livingston and supervised by Grant, was built between March 1931 and July 1932.<sup>10</sup>

In 1917 in response to a July 1, 1916, congressional act, Colonel Harts and his successor Clarence S. Ridley compiled a map showing all the buildings in Washington's central area owned, rented, or erected as temporary structures to house World War I workers. Their map particularly noted twenty-nine buildings occupied by different divisions of the War Department. In 1917 the office built three temporary office buildings,



the infamous “temps,” on the Mall, followed in 1922–23 by the Navy and Munitions Office, a long range of demountable structures in West Potomac Park that faced Constitution Avenue between 17th and 23rd Streets.<sup>11</sup>

By October 1918 the colonnade of the Lincoln Memorial was completed under the direction of Lieutenant Colonel Ridley. When work began on the Reflecting Pool in November 1919, the presence of the temps forced the elimination of the short north-south arm from the cross-shaped pool planned by the Senate Park Commission in 1902. Constructing the pool’s drainage system was the major challenge faced by the Corps’ engineers with Ridley in charge at the project’s outset. Even with the simpler design without the cross arm, Ridley and his assistant, civil engineer Charles A. Peters, Jr., faced construction problems resembling those that confronted builders of the Lincoln Memorial. An initial plan to build a single concrete conduit to drain into the Tidal Basin 600 feet to the southeast proved impossible because of ground water flooding. (The difference in elevation of the pool’s bottom and the river’s average high tide was only 3.5 feet.) The engineers then devised an extensive drainage system along the pool’s axis with multiple connections to the main conduit. They designed a three-ply surface of reinforced

*Cornerstone laying ceremony for the Red Cross Building, March 27, 1915. President Woodrow Wilson and Mrs. Wilson (second and third from left, on stand) and Col. William W. Harts, Engineer Officer in Charge of Public Buildings and Grounds (fifth from left), watch as former President William H. Taft lays the cornerstone for the building initially intended as a Memorial to Women in the Civil War.*

*Library of Congress, Prints and Photographs Division, Lot 12281*

*Red Cross Building under construction in 1916. Colonel Harts superintended the construction of three major marble buildings in Washington, including the first of three buildings for the Red Cross built between 1915 and 1932. Office of History, Corps of Engineers, ARCE 1916*



concrete, membrane, and tile to maximize the pool's mirroring effect and prevent seepage, while remaining flexible enough to adjust to continuous land settlement. A concrete apron and hinged joint connected the pliable bottom of the pool to the rigid coping, which rested on piles driven to bedrock. As the land settled, the pool maintained its fixed relation to the lines of the memorial. Completed in 1923 under Lieutenant Colonel Sherrill, the Reflecting Pool is 2,027 feet long and 160 feet wide; the transverse Rainbow Pool at its east end (also planned by the Senate Park Commission) measures 291 feet long and 160 feet wide. In 1998 the Reflecting Pool's east end was selected as the site of the World War II Memorial, its architect Friedrich St. Florian making the Rainbow Pool the focus of the memorial's commemoration of those lost in that war.<sup>12</sup>

In 1920 Ridley arranged impressive ceremonies to dedicate the Arlington Memorial Amphitheater, which had been built under his supervision. Although first suggested in 1908, the amphitheater's commission was not established by Congress until 1913; the Secretary of War was named its chairman. Ground was broken in 1915 for a one-and-one-half-acre oval amphitheatre to hold ceremonies, such as those held on Memorial Day, that honored all of the nation's war dead. The portico of its reception building provided the backdrop for the Tomb of the Unknown Soldier.

The completion of two other major projects soon added additional memorial sites that commemorated the Civil War. By 1920 sculptor Daniel Chester French finished his statue

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*“Henry Mervin Shrady has with years of labor and infinite pains here produced one of the great monuments of the world.”*

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of Lincoln for the memorial leaving only the terrace wall, landscaping, and access roads to be completed. On May 30, 1922, Memorial Day, a crowd of tens of thousands and 3,500 invited dignitaries attended the dedication. Robert T. Lincoln, eldest son of President Lincoln, and Secretary of War under Presidents Garfield and Arthur, was introduced by Chief Justice William Howard Taft, the presiding officer. A month earlier, on April 28, Vice President Calvin Coolidge watched the unveiling of the Grant Memorial. Sherrill, who again made all the arrangements for the ceremony and invited its numerous speakers, briefly spoke as the executive officer of the Grant Memorial Commission.<sup>13</sup>

*Henry Mervin Shrady has with years of labor and infinite pains here produced one of the great monuments of the world. As an adornment to the city of Washington, this memorial ranks with the greatest works of the sculptor's art, and will forever adorn the imposing approach to the Capitol that will result from the completion of the Mall and Union Square in accordance with the plan of George Washington and L'Enfant.*<sup>14</sup>

Posterity has verified Sherrill's assessment. Mindful of the importance of the history of the design and construction of the Lincoln and Grant memorials, Sherrill and his successor

*Dedication of the Arlington Memorial Amphitheater, May 15, 1920. Capable of seating five thousand people, the amphitheater was begun in 1915 but delayed by scarcity of materials during World War I and bad winter weather.*

*Library of Congress, Prints and Photographs Division, LC-H813-A05-022*

Ulysses S. Grant III were responsible for the publication of books that were compilations of documents and essays as well as the record of these important ceremonial occasions for each memorial.<sup>15</sup>

#### ARLINGTON MEMORIAL BRIDGE

Postwar projects were in general more practical, less purely monumental than those of prewar days. One project, however, combined both characteristics—the Memorial Bridge to Arlington Cemetery. Congress long debated whether to construct the bridge, engineers urged it, and the Senate Park Commission made the bridge an essential part of its plan. A new Washington menace—automobile traffic—helped bring the structure at last into being. In November 1921 a spectacular jam occurred as dignitaries and visitors to the dedication of the Tomb of the Unknown Soldier attempted to cross the Potomac River on the highway bridge.

Arriving at the west bank two hours or more late, the crowds found themselves entering the cemetery on a road that led past “a little race track, ...marshes lately used as the city dump, and...the Agriculture Department barns, so designed and constructed as to thrust their ugliness upon one’s attention with all the insistence of a spoiled child at table.” Dedication of the Lincoln Memorial the following year revealed a great *rond point* situated at the edge of the river with no outlet, while across the Potomac River, Arlington Cemetery with its new amphitheater lay almost inaccessible. Less than two weeks after the dedication of the Lincoln Memorial, Congress voted \$25,000 to begin work on the bridge.<sup>16</sup>

In 1916 the Arlington Memorial Bridge Commission, moribund since 1913, was revived with Sherrill named its executive officer. In 1922 both Major Tyler of the Engineer Commissioner’s office and now General Beach concurred with Sherrill that the bridge’s landfall in Washington should be at New York Avenue near Observatory Hill rather than at the Lincoln Memorial as the Senate Park Commission had planned. They argued that such an alignment would not require a draw (because of its height), would bring users into the heart of the city, and would not interfere with the Lincoln Memorial. The view of the Commission of Fine Arts, led by its secretary Charles Moore, who had been Senator McMillan’s secretary, was that a low, arched bridge between Arlington and the Lincoln Memorial would be more in harmony with the Mall’s development. Moore released to the public his ten-page report to the Arlington Memorial

Bridge Commission which angered President Warren G. Harding, the bridge commission's chairman. Yet visits to Arlington and the district sites on December 18, 1922, convinced Harding that the Lincoln Memorial landfall was preferable, partly because it was anticipated that the bridge's main users would be tourists traveling between the two sites. The memorial's landfall would also maintain the horizontal vista of the city from Arlington.

In January 1923 Sherrill, who opposed a draw in a low-arched bridge, conducted public hearings about the necessity for a draw. Georgetown business interests convinced him that a draw was vital to local commerce and Sherrill relented. Plans went forward based on a bascule draw in the center arch. Once the large engineering concerns were settled, Sherrill conferred with the Commission of Fine Arts about choosing a suitable architect rather than holding another competition. They chose the New York architectural firm of McKim, Mead & White, a firm whose founding principals, now deceased, were once deeply involved in Washington's revitalization. In January 1926 Sherrill was replaced by Grant, who worked with both John L. Nagle, the bridge commission's own engineer, and the engineers on the architectural firm's staff. The low, Roman aqueduct-inspired bridge designed by William M. Kendall with the McKim, Mead & White office, was based on the bridge depicted on the Senate Park Commission's drawings proposed by its chairman Daniel Burnham in 1901. With broad, graceful arches and pylons at each end topped by symbolic statuary, the bridge was intended to be as unobtrusive as possible, its Roman character a fitting link between the Lincoln Memorial and Arlington House (Robert E. Lee's house at the outbreak of the Civil War) built a century earlier. Memorial Bridge was both a metaphorical and physical link between the North and South, the symbolic linkage between Lincoln and Lee meant to heal the still raw wounds in the aftermath of the war. Moreover, the bridge's superstructure was built using Roman architectural principles: "[T]he visible arches are being built as true granite arches, each stone deep enough to play its part as a voussoir of a real masonry arch and to bear its share of the weight of the bridge deck," Grant reported to President Calvin Coolidge in 1928.<sup>17</sup>

Amid a squabble with Associated General Contractors over the hiring of day labor, work began in 1925 under Sherrill and continued under Grant. Central to the problem of building the bridge was the need to make a practical structure conform to the Senate Park Commission's low-slung, simple design. The bridge had to bear the weight of granite facing and statues, and the bascule draw in the central arch had to be as inconspicuous as possible. Machinery needed to be packed away out of sight beneath the

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## CONSTRUCTION OF THE ARLINGTON MEMORIAL BRIDGE

First proposed in 1886, the Arlington Memorial Bridge, begun in 1925 and completed in 1932, serves as both the physical bridge and symbolic link between the Lincoln Memorial and the Custis-Lee house, Robert E. Lee's home in Arlington Cemetery. To accommodate the bridge's low Roman aqueduct profile, but allow for a draw span, powerful machinery was concealed in the piers to lift the two particularly broad sections of the draw.



*May 1929*



*n.d.*



*September 1930*

*n.d.*



*Library of Congress, Prints and Photographs Division, LC-H824-T-321  
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Library of Congress, Prints and Photographs Division, LC-H824-T-3529-x*

roadway. The draw itself, though neither the longest nor the widest in the world, had one of the largest areas to be raised; and the concrete deck and ornaments made it one of the heaviest and most costly ever built. While Grant, Nagle, and Strauss Engineering Corporation—designers of the draw span—struggled with these difficulties, the Engineer District diverted the channel of the river beneath the draw, widened approaches, and cut and filled Columbia Island. Completed in 1932, the bridge successfully met both architectural and practical needs while bringing the Senate Park Commission plan a step nearer completion.<sup>18</sup>

#### **BRIDGES, WATER SUPPLY, AND ANACOSTIA RECLAMATION**

Corps engineers directed the construction of three additional Washington bridges during the 1920s and 30s: the Francis Scott Key Bridge that linked Georgetown with Rosslyn, Virginia, across the Potomac River; a new Chain Bridge that spanned the wide and rocky Potomac River near Little Falls; and the John Philip Sousa Bridge that carried Pennsylvania Avenue, SE, across the Anacostia River.

The Washington Engineer District built a new, modern bridge across the Potomac near the site of the old, often modified Aqueduct Bridge. The five high reinforced concrete arches (two additional arches were added in 1939) of Key Bridge, designed by Washington architect Nathan C. Wyeth in 1916, paralleled the Aqueduct Bridge that was taken down after the Key Bridge opened in 1923. Wyeth's open spandrel design was constructed entirely in reinforced concrete under the supervision of Colonel Walter L. Fisk and his successor Major Max C. Tyler. The engineers began work in August 1917. Coming out of retirement to head the wartime Engineer District, Fisk encountered the usual problems of the time: Wyeth left the project to take a commission in the Army; labor and materials were hard to come by; and the staff of the District Engineer's office was depleted by military demands. One step the engineers took was to dispense with private contractors and employ day laborers on the project. Their method of pouring the massive amounts of concrete that covered the arches' steel ribs was placing one stationary concrete mixing plant on shore and ferrying containers of concrete to necessary points via a cableway while another mixing plant on a barge was anchored to the river bottom. The bridge was 1,791 feet long and unusually wide for the time, the roadway being fifty feet in width and each of the sidewalks eight feet wide.<sup>19</sup> The completed bridge, equipped for streetcar, automobile, and foot traffic, opened in January 1923. The engineers turned it over to the municipal government for administration, and

it was named in honor of former Georgetown resident Francis Scott Key because its landfall was near his house.<sup>20</sup>

In 1925 the ninety-year-old Aqueduct Bridge was closed to traffic, having been opened as a public thoroughfare in 1868; the Washington and Old Dominion Railway removed its track; the commissioners salvaged railings, floors, and stringers; and the district removed some of the masonry for use in the new Anacostia floodwalls. Four of the salvaged steel trusses went into a bridge over Rock Creek on the Rock Creek and Potomac Parkway, just south of the Connecticut Avenue Bridge, in 1926.

The Engineer Commissioners of the District of Columbia also worked to improve river crossings in the city. They replaced two older bridges on the Potomac and Anacostia rivers. The present Chain Bridge is the eighth on the site, replacing the 1874 bridge erected by the Corps and using its piers. The 1,341-foot-long bridge was designed by Modjeski, Masters & Chase of Harrisburg, Pennsylvania, and built by the Fuller Construction Company of New Jersey in 1938–39. The Sousa Bridge—for which designs were considered in 1936, construction begun in 1938, and completion occurred in 1940—also

*The arches of Key Bridge under construction (n.d.). The old Aqueduct Bridge is just north of the arches with Georgetown University visible in the upper right.*  
*Office of History, Corps of Engineers*





*Aqueduct and Key Bridges intersecting near the Rosslyn shore, December 1929. The Aqueduct Bridge was largely dismantled several years after Key Bridge was opened for traffic in 1923. Office of History, Corps of Engineers*

replaced a nineteenth-century iron bridge erected by the Corps. Engineer Commissioner Lieutenant Colonel David McCoach, Jr., built the 1,666-foot-long bridge, designed with nine stone-faced reinforced concrete piers set 154 feet apart carrying low arches rising thirty feet above high tide. The New York architectural firm of McKim, Mead & White designed the Sousa Bridge along with the New York engineering firm of Parson, Klapp, Brinkerhoff and Douglas.<sup>21</sup>

During the previous decade of the 1920s, the Washington Engineer District's aqueduct division had completed a major expansion of the water supply system. During World War I, when the city's population had greatly expanded, the system reached its limits. In 1921 Congress approved the most comprehensive expansion of the Washington Aqueduct in its history, doubling its capacity. The engineers built a new intake structure on the Potomac at Great Falls and a new ten-foot concrete tunnel under Conduit Road (renamed MacArthur Boulevard during World War II) and next to Meigs' original conduit. The project proceeded without mishap except for a washout in 1924 that damaged the old conduit and interrupted



water distribution in the system for two days, almost exhausting the reserve supply in the city's three reservoirs.

To treat the large new intake of raw water, the aqueduct built a major new treatment plant near the old receiving reservoir on the site of the former Dalecarlia farm named for a province in Sweden. The new facilities at Dalecarlia included several basins for chemical treatment and sedimentation, twenty new rapid sand filters, a storage reservoir, and buildings to support these operations. In addition, the aqueduct built a new pumping station with nine new pumps to move water through the distribution system, including several new reservoirs located on high spots in the district. The increased capacity of the aqueduct assured reliable water supply to the city and to a new customer, Arlington County, added in 1927.<sup>22</sup>

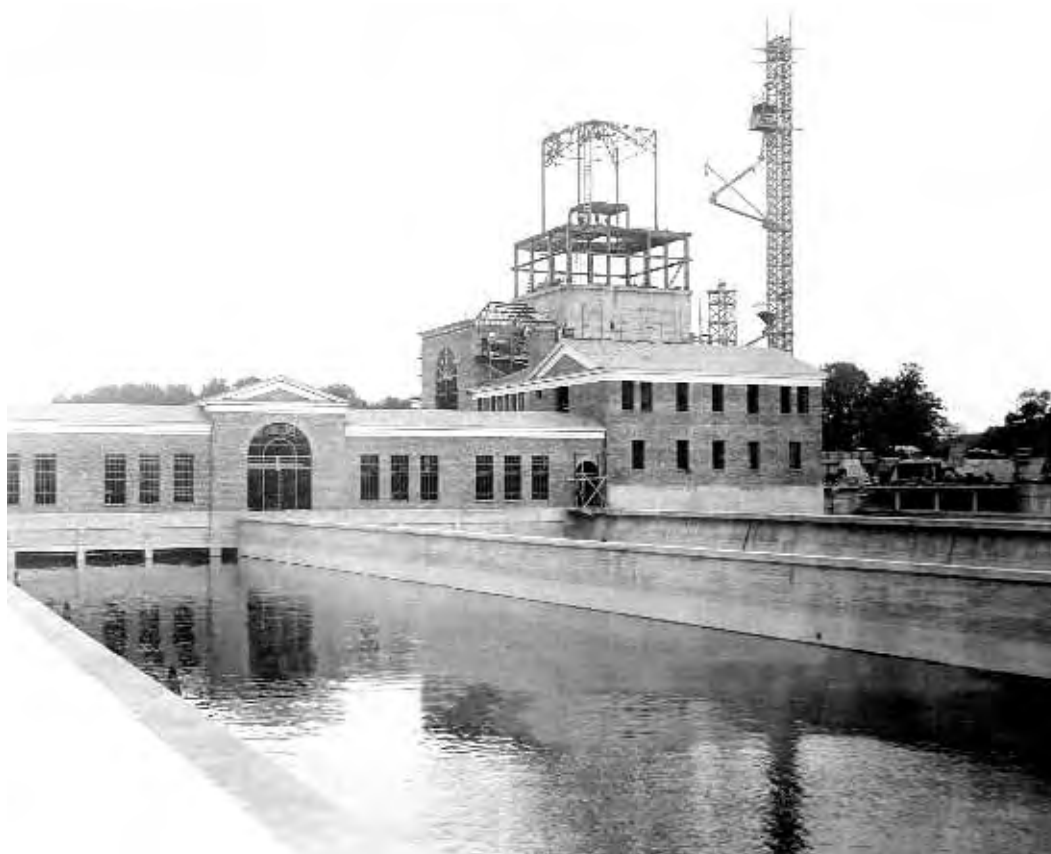
In 1916 the Washington Engineer District began work on reclamation of the Anacostia River flats, along the lines originally proposed in the 1902 Senate Park Commission report, and continued for many years, guided by the size of Congressional appropriations. When

*New Washington Aqueduct conduit under construction, May 1923. Steel forms that moved on tracks were used in building the concrete walls of the new conduit.*  
Washington Aqueduct Division,  
Baltimore Engineer District

*Filter plant superstructures under construction, ca. 1926.*

*The 1926 Dalecarlia filter plant, one of the most prominent structures on Conduit Road, was designed in the Colonial Revival style to blend with its residential neighbors and was part of the extensive expansion of Washington Aqueduct facilities during the 1920s.*

*Washington Aqueduct Division,  
Baltimore Engineer District*



Congress in 1923 asked the engineer board to consider scaling back the project, eliminating reclamation and the development of parkland above Benning Road, the board reported:

*Already much benefit has resulted from the filling in of the marshes below Benning Road. Malaria, which was formerly a common disease at the navy yard, Government Hospital for the Insane, Washington Barracks, and the District Jail, institutions adjoining these marshes, has now almost disappeared. As the section of Anacostia Park above Benning Road is the only remaining mosquito-breeding marsh in the District of Columbia, the reclamation work should be continued.<sup>23</sup>*

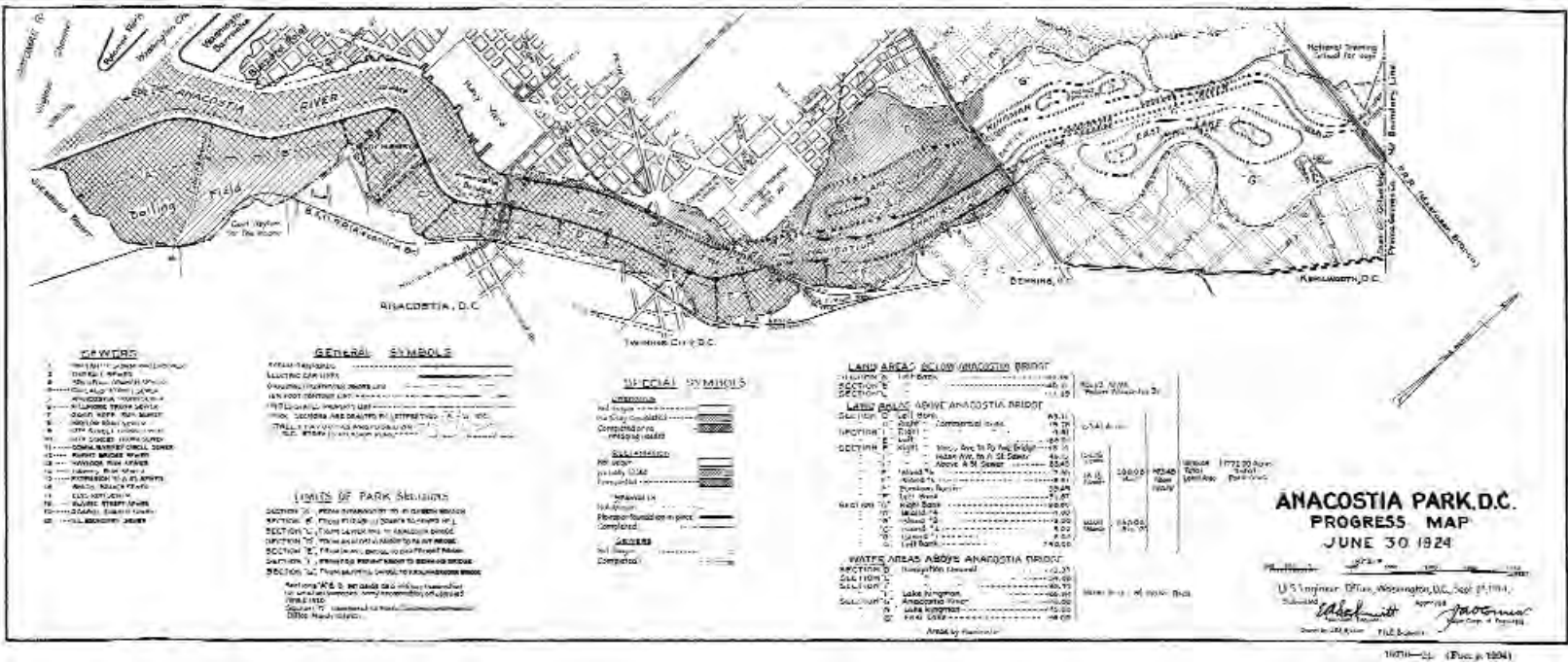
In 1918 Congress made the reclaimed land along the Anacostia River part of the District of Columbia's park system, naming it Anacostia Park. By mid-1920 the project was nearing the halfway mark. Sanitary conditions improved, and deep-draft vessels could use the river as far north as Pennsylvania Avenue. In 1925 part of the reclaimed land was transferred to the Director of Public Buildings and Public Parks for improvement, and another portion set aside as a site for the Agriculture Department's planned U.S. National Arboretum and Botanic Garden.<sup>24</sup>



*The Corps of Engineers' dredge Dalecarlia at work on Anacostia River reclamation (n.d.). Like the reclamation of the Potomac flats, the Anacostia work required extensive dredge and fill operations to drain and reclaim its extensive marshland.*  
*Office of History, Corps of Engineers*



*Anacostia Reclamation Project, July 1929. This aerial photograph shows the work on Section G of the project.*  
*Office of History, Corps of Engineers*



*Washington Engineer District map showing the progress of the Corps' dredging and reclamation work and seawall construction on the Anacostia River as of June 30, 1924. The unshaded area on the far right of the map is Section G.*

*Office of History, Corps of Engineers, ARCE 1924*

# WASHINGTON PARKS

Land acquisition by the Office of Public Buildings and Grounds for Rock Creek Park continued slowly after Congress appropriated the first funds in 1916, and then released only a limited amount of money each year. A congressional fight in 1925 led to the approval of the first funds for improving the nascent reservation. Grant, who became head of the reorganized Office of Public Buildings and Public Parks in 1926, oversaw much of the final design of the parkway, working with the landscape architectural firm of Olmsted Brothers to modify the general outline developed by Morrow and Markham in 1908, Harts in 1916, and Sherrill's office in 1924. The engineers and civilian landscape architects of his office did all the drafting for the construction: landscape architect James G. Langdon, formerly an employee of Olmsted Brothers who had worked for the Senate Park Commission, drew the 1916 map of the parkway. Aside from some preliminary brush and rubbish clearing, construction began with a bridle path in 1923. Further landscape adjusting and road building occurred in phases all along the path of the road, until by 1933 and the transfer of control over the capital's parks to the National Park Service, only the extensive restoration of the valley between P Street and Pennsylvania Avenue and one major bridge remained to be undertaken.<sup>25</sup>

In 1906 Mary Foote Henderson, wife of Senator John B. Henderson, proposed to Congress that the government build a formal urban park on the hilly twelve-acre site east of 16th Street, NW, on Meridian Hill a mile and a half north of the White House. In 1910 the property was transferred to the Office of Public Buildings and Grounds and a succession of major American landscape architects proposed designs for the site. In 1925 the Office of

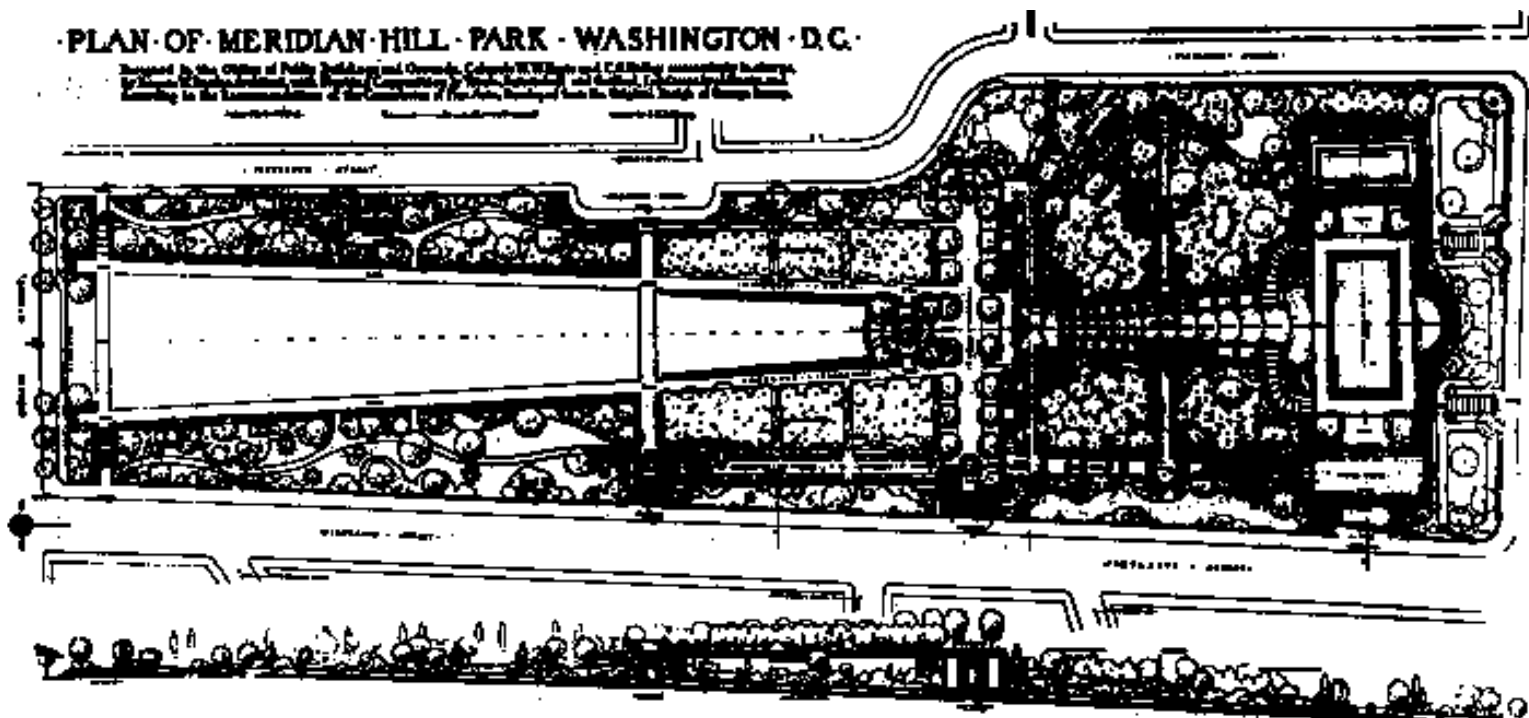


Public Buildings and Public Parks was organized into divisions with the Design and Construction Division having four sections that included Engineering Design, Landscape Design, and Surveying. Engineer Major M. C. Mehaffey was appointed the division's first chief and construction of Meridian Hill Park was the major landscape project the division undertook before its responsibilities were transferred to the National Park Service in 1933. New York landscape architect Ferruccio Vitale (beginning in 1919) and Washington architect Horace Peaslee (beginning in 1915) were the designers of the park that evolved into a major architectural work in reinforced concrete in imitation of an Italian Renaissance garden. The concrete and mosaic work was executed by Washington's architectural sculptor, John J. Earley, in concrete and overall construction was supervised by Colonel Grant.<sup>26</sup>

*Construction of the wall  
along the Potomac, June 1930.  
The completed wall and the  
fill behind it became the  
foundation for the Rock Creek  
and Potomac Parkway when it  
was built later in the 1930s.  
Office of History, Corps of Engineers*

#### **OFFICE OF PUBLIC BUILDINGS AND PUBLIC PARKS**

Meanwhile, in the heart of the district a new era of major construction opened in 1926 when Congress passed the Public Buildings Act that established the Public Buildings Commission in the Department of the Treasury to develop the Federal Triangle. Under the



(*Top*)

*“The Plan of Meridian Hill Park, Washington, DC, Designed in the Office of Public Buildings and Grounds,” ca. 1920. Architect Horace W. Peaslee’s and landscape architect Ferruccio Vitale’s plan for the new park located at 16th and W Streets, NW, was based on Italian Renaissance gardens to complement nearby European-inspired Beaux Arts mansions.*

*National Archives no. 66-DC-19*

(Bottom)

*Meridian Hill's upper terrace—as well as the site's outer retaining walls and other architectural features—was constructed of reinforced concrete whose surfaces were covered with small stones. Because of the Depression and scarce funding, the park was not completed until 1936 after it had become the responsibility of the National Park Service.*

Library of Congress, Prints and Photographs Division,  
HABS, DC, WASH, 486-50



direction of Secretary of Treasury Andrew Mellon and the Supervising Architect of the Treasury, massive government buildings began to rise in the angle between Pennsylvania and Constitution Avenues, on the site suggested by interested Washingtonians in the late 1880s and given official sanction by Bingham in 1899 and the Senate Park Commission in 1902. Grant was the executive and disbursing officer of the Public Buildings Commission, a position that strengthened his role as an influential administrator in the shaping of Washington. Under the general architectural direction of Chicagoan Edward H. Bennett, seven massive and complex Beaux Arts buildings were designed by the country's leading firms. Under Grant's administration, they were all erected in just over a decade—the entire complex larger than the Louvre in Paris or the Vatican in Rome. In 1929 Grant was elected an honorary member of the American Institute of Architects for his outstanding work with the Public Building Commission.<sup>27</sup>

The increased responsibilities of the Office of Public Buildings and Grounds, in both scope and number, led to the Corps' gradual separation from oversight by the War Department in matters relating to public buildings. In many ways it functioned as an independent agency. Though the officer in charge was nominally subject to the Chief of Engineers—and to a supervisory commission in the case of his care of the State, War and Navy Building—the control was largely a formality. As a military aide to the president, the head of buildings and grounds had direct access to the chief executive, and was “effectually subject to the President's direct control.” Queried by Congress, the



*The future site of the Federal Triangle, seen here in a ca. 1900 photograph, was known as “Murder Bay” when the 1902 Senate Park Commission proposed it for public buildings. All but the Old Post Office (middle left) were replaced by massive executive department buildings for which Col. Grant was the disbursing officer during the 1920s and 1930s. The once commercially important Center Market (upper right) fell victim to the redevelopment.*

*Library of Congress, Prints and Photographs Division, LC-BH85-34*

Secretary of War raised no objection to a proposal to place the office formally under the president alone. On February 26, 1925, the office was reorganized as the Office of Public Buildings and Public Parks, and in 1926 Grant was named its head. He initially oversaw almost 3,428 acres of parkland in 562 reservations, and added almost 100 more reservations before the federal lands were transferred to the National Park Service in 1933.<sup>28</sup>

Grant used his innate judgment about the importance of adequate recreational areas in and near urban areas and hard statistics to foster the increase of recreational areas in Washington's suburbs.

*The officers in charge of public buildings and grounds, successors to Colonel Bingham, have also naturally followed the plan of 1901 as far as practicable and have given their support to those of its projects which have been adopted. Gratifying as the progress was, it was very inadequate. The method*



**Colonel U. S. Grant III**  
*Photograph by Bachrach*

*It was through the Office of Public Buildings and Public Parks that Grant rose to prominence in Washington. The grandson of the eighteenth president soon established himself as a hard worker, a demanding supervisor, and a press agent's dream. Born in 1881, the son of an Army officer and diplomat, Grant graduated from West Point in 1903, sixth in his class, and four years later married Edith Root, daughter of Elihu Root, who had been Secretary of War, but was Secretary of State in 1907. Stories about him grew into a personal legend, fed by his skill at publicity and a rich supply of quirks and personal oddities. Impatient with fools and visiting firemen, he wore heavy underwear to work in winter so that he could turn off the office heat; unwelcome visitors then fled to warmer regions. In 1928 he got the Washington parks into the newspapers by declaring a "war on neckers." Park users were asked to abide by a pledge that encouraged fire prevention and forbade littering, flower picking, and—the item that caught newsmen's eyes—any "display of amorousness" that might "set a bad example for children" in the puritanical Washington woods. Meantime, black citizens came to know a harsher side of Grant, as he sanctioned a Ku Klux Klan rally on government property, tried to segregate picnic places in Rock Creek Park, and barred blacks from the bathing beach at the Tidal Basin.<sup>29</sup>*

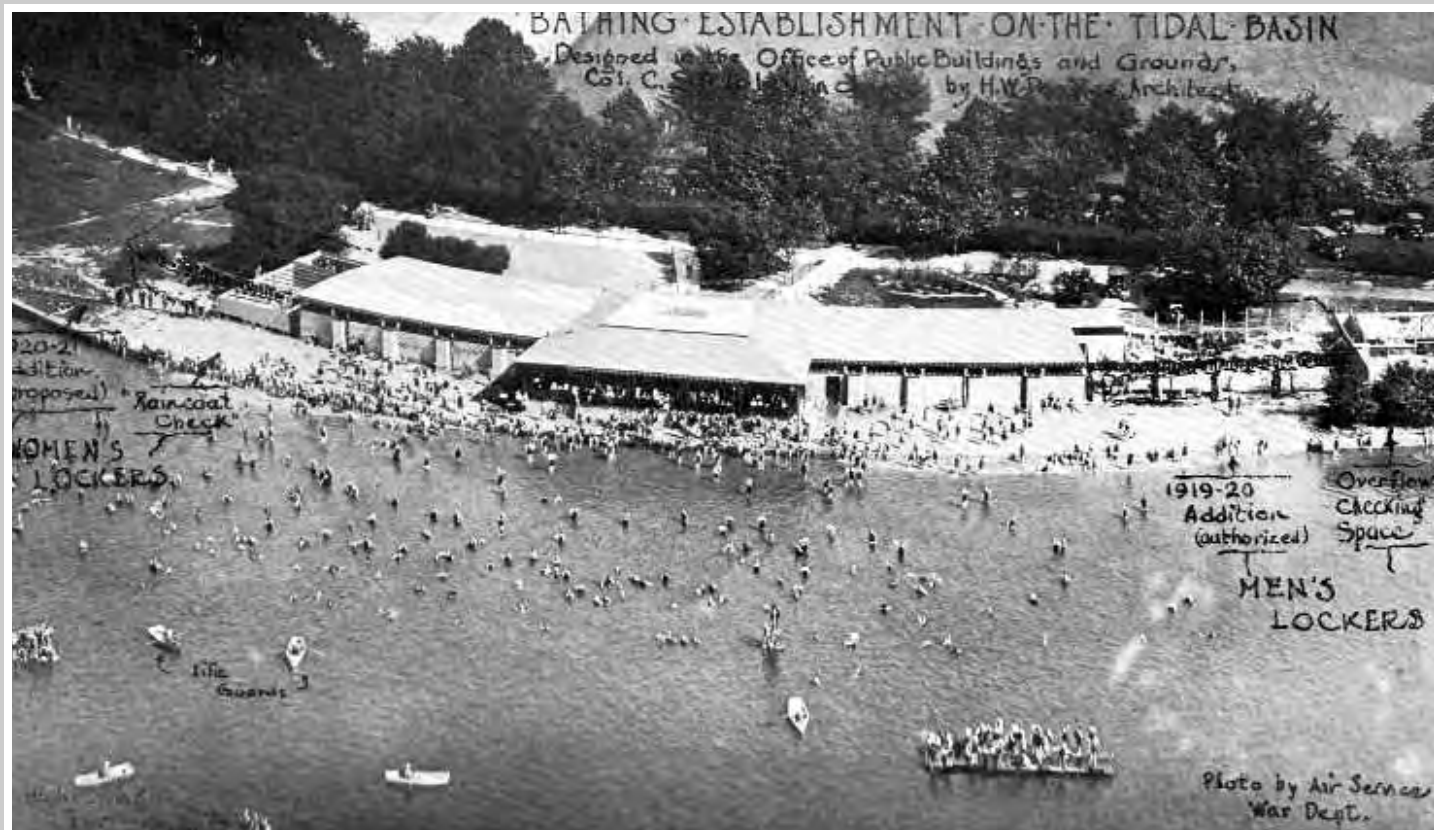


*of seeking legislation for one project at a time, thereby lining up against it the backers of other projects as well as the enemies of the particular one under consideration, had by 1925, for instance, provided only an addition of 24 per cent to the total park area of 1901, while the population had increased 70 per cent.<sup>30</sup>*

*Construction of the Post Office Department Building at 13th and D Streets, NW, within the Federal Triangle, 1930s. It was to overlook a landscaped Great Plaza which became a parking lot until replaced by the Reagan Building in the 1990s.*

*Library of Congress, Prints and Photographs Division, LC-H823-1699*

Grant fought effectively for public recreation and an extended park system. “I think,” said a civilian planner who worked under him for many years, “he had the highest standard of public service of anybody I’ve ever known.” As head of public buildings and parks, Grant removed as many tempos as he could and cleared and developed the Mall. As a planner he later took a leading role in buying land for Rock Creek and Potomac Parkway and worked with the firm of Olmsted Brothers on the parkway design. When necessary, Grant stood up to his fellow officers. He successfully opposed Washington District Engineer Major Brehon B. Somervell and the Chief of Engineers to preserve a stretch of Potomac shore for parks rather than a power plant. Public tributes to Grant by





MANY ENGINEER PROJECTS ASSOCIATED WITH WASHINGTON'S MODERNIZATION OFFERED ANCILLARY BENEFITS TO RESIDENTS AND VISITORS ALIKE. A BATHING BEACH ON THE TIDAL BASIN WAS FIRST SUGGESTED BY THE WASHINGTON BEACH ASSOCIATION IN 1889 AND PROMOTED AS A MAJOR FEATURE OF THE 1902 SENATE PARK COMMISSION PLAN. A VARIETY OF FACILITIES WERE PROVIDED BY THE OFFICE OF PUBLIC BUILDINGS AND GROUNDS AND THE DISTRICT COMMISSIONERS IN SEVERAL LOCATIONS ON THE RECLAIMED LAND CREATED BY THE CORPS, WITH THE NORTH SIDE OF THE INNER BASIN PREFERRED

BECAUSE OF THE WATER'S PURITY. HOWEVER, ITS DEPTH LED TO MANY DROWNINGS. IN 1914 COL. HARTS BEGAN PLANNING FOR A NEW LOCATION ON THE SOUTHEAST SIDE OF THE TIDAL BASIN SHADED BY THE CHERRY TREES PLANTED UNDER THE DIRECTION OF COL. SPENCER COSBY, OFFICER IN CHARGE OF PUBLIC BUILDINGS AND GROUNDS, IN 1912. FURTHER NORTH, THE REFLECTING POOL SOON BECAME A CHOICE LOCATION TO SAIL TOY BOATS IN THE SUMMER OR, WEATHER PERMITTING, ICE SKATE IN THE WINTER—A TRADITION, SEEN HERE IN THE 1940s, THAT BEGAN WITH AN EXCEPTIONALLY COLD JANUARY IN 1925.

those who worked for him attested to not only his integrity, but his personal charm. “He could even handle a commission on which there were both members of Congress and executive officers of the Government, a most difficult job. His many assignments in Washington were in that touchy, nervous area where the Federal and local governments meet, but his diplomacy was adequate.”<sup>31</sup>

Grant also carried out a large-scale reconstruction of the White House, which Sherrill had begun. After investigations in April 1923 showed the mansion’s roof near collapse, President Warren G. Harding instructed Sherrill to begin repairs during his own absence on an Alaskan trip (from which he did not return alive). After examination showed that “the trusses carrying the roof are no longer acting as trusses, but are now merely a series of beams and struts,” Grant warned the new president, Calvin Coolidge, that the whole roof should be replaced at a cost of \$500,000. But the Vermonter refused to pay the cost no matter what the danger. “If it is as bad as you say it is,”—an engineer later summed up the president’s attitude—“why doesn’t it fall down?” Consequently, Grant and the Supervising Architect of the Treasury carried out a less drastic renovation that included rebuilding the roof and third story, fireproofing the interior, and painting. With advice from consulting architects, William Adams Delano and Charles Adams Platt, and experts on American decorative arts, the work was successfully completed in 1927.<sup>32</sup>

Grant also became a key figure in the development of the National Capital Park and Planning Commission (NCPPC). Systematic land acquisition had long been suggested by Harts and other park enthusiasts to ensure the system’s growth in the face of rising land prices. Urged on by powerful advocates, including the Chief of Engineers and Washington’s city-wide citizens’ group, the Committee of 100 headed by district resident Frederic A. Delano, Congress on June 6, 1924, set up a National Capital Park Commission consisting of three officers of the Corps of Engineers, two members of Congress, and two civil servants. Money was to be provided by a yearly appropriation equal to one penny for every inhabitant of the continental United States, and the commission was empowered to acquire land by purchase or condemnation. But first appropriations were less than promised.

Under continued pressure from park advocates, Congress, in April 1926, enlarged the commission by providing for appointment of four leading district citizens, renamed it the National Capital Park and Planning Commission, and gave it authority to plan for the city’s growth. The commission was to plan Washington’s street system as well, taking over duties that the highway commission had carried out since 1890. Its third responsibility was the

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*“I think he had the highest standard of public service of anybody I’ve ever known....”*

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*“If it is as bad as you say it is, why doesn’t it fall down?”*

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purchase of land for parks, parkways, and playgrounds. Frederic Delano chaired the commission and Charles Eliot II was the city planner. Grant was secretary and executive officer. His relationship with Presidents Coolidge and Hoover was sufficiently close that Eliot credited him with “managing the White House” in regard to commission projects. Soon the commission took the first steps toward area-wide planning, working with a similar suburban planning commission set up in 1927 by the state of Maryland.<sup>33</sup>

#### WASHINGTON CHANNEL IMPROVEMENTS

The Depression brought a new Washington District project to improve the Washington Channel. Sheltered by the peninsula of East Potomac Park and flushed by the Tidal Basin, the channel had become an informal recreation spot, with wharves for oyster and melon boats, and landings for river steamers that made trips to Baltimore and Norfolk. But buildings had slipped into decay, and only the federally owned wharves were in good condition. In the 1920s Colonel Bell devised the master plan for the development of the Washington Channel that included commercial and recreational wharfs along the Southwest waterfront and replaced the original Water Street with Maine Avenue. After

*Washington Channel Waterfront, Yacht Basin No. 1, July 1939. In the 1930s the Washington Engineer District began a program to improve the Washington Channel waterfront, but sporadic funding during the Depression meant that the district completed only parts of the project by the end of the decade.*

*Office of History, Corps of Engineers*



## REBIRTH OF THE MASSACHUSETTS AVENUE BRIDGE

The 1901 viaduct-and-culvert bridge that carried Massachusetts Avenue across Rock Creek was built to serve new suburbs immediately north of the park. In 1925 a roadway was built through the culvert, but frequent floods caused traffic bottlenecks. Construction of the Rock Creek & Potomac Parkway, completed in 1936, required a higher bridge with substantial clearance beneath it. The current Massachusetts Avenue Bridge was designed by Washington's leading modernist architect Louis Justement and engineers Harrington and Cortelyou as a simple, 150-foot-long single reinforced concrete arch faced with stone. During construction, supervised by Captain Herbert C. Whitehurst of the D.C. Highway Division, traffic continued across Massachusetts Avenue on a temporary three-lane bridge as well as on the parkway through the culvert. In April 1941 the south side of the new bridge opened to traffic and in August the old culvert was dynamited to make room for new parkway lanes under the direction of the National Capital Park and Planning Commission.



*March 1940*



*April 1941*



*July 1941*



*August 1941*



*August 1941*

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 Washingtoniana Division, D.C. Public Library  
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long urging by the engineers, Congress authorized an examination and survey of the area. In 1930 the Washington Engineer District proposed a \$3.7 million plan to refurbish the waterfront while preserving local landmarks such as the Capital Yacht Club and the fish market. The new wharves and marinas were only partially complete when the outbreak of war ended work.<sup>34</sup>

#### **MOUNT VERNON MEMORIAL HIGHWAY**

The Corps contributed to the creation of what one historian called “the first modern motorway built by the federal government,” the Mount Vernon Memorial Highway, now a part of the George Washington Memorial Parkway. This scenic road almost fifteen miles in length was constructed between 1929 and 1932 to connect Arlington Memorial Bridge with George Washington’s famous estate.<sup>35</sup> Congress ordered the Corps of Engineers to study the possibility of connecting Aqueduct Bridge to Mount Vernon with a formal road in 1889. District Engineer Colonel Peter C. Hains proposed three routes and provided his report with landscape plans and bridge designs.<sup>36</sup> The McMillan Commission in its 1902 park system report endorsed one of Hains’s routes.<sup>37</sup> Increased motor tourism in the 1920s and the approach of the 1932 bicentennial of Washington’s birth led Congress to authorize the highway’s construction in 1928. It was designed by the Bureau of Public Roads to run along the Potomac, passing through and following the river.<sup>38</sup> Sections of the road were built on landfill and two-and-one-half miles of artificial causeway. Numerous bridges were required over creeks that fed into the Potomac. The Corps of Engineers undertook the necessary and extensive hydraulic fill work, first under District Engineer Major Brehon B. Somervell and then under District Engineer Major Joseph D. Arthur.<sup>39</sup>

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*“[T]he first modern motorway built by the federal government.”*

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#### **WASHINGTON NATIONAL AIRPORT**

In 1938 at President Roosevelt’s urging, the Civil Aeronautics Authority chose a site for a major new Washington airport. The tiny Washington-Hoover Airport emerged from the combination and expansion in 1930 of Hoover Field (1926) and Washington Airport (1927), built across the road from one another near the Virginia end of the Highway Bridge. Increasing airmail and passenger traffic quickly surpassed its capacity. In 1937 Roosevelt vetoed a bill that would have permitted expansion of Washington-Hoover, believing that a new airport a mile south at Gravelly Point, and only 3.5 miles from downtown Washington, would better serve the capital and national defense needs.

*Dredging and filling at the site of National Airport, January 1939. This aerial view looking southeast down the Potomac River shows the outline of the airport beginning to appear. A section of the Mount Vernon Highway that had to be relocated curves through the center of the photograph.*  
Office of History, Corps of Engineers



*The Corps' dredge Talcott moving dredged material from the Potomac River bottom through pipes to the fill area behind the dike built by the Corps, May 1939. Five hundred of the airport's 729 acres were landfill for which Corps engineers moved twenty million cubic yards of material.*  
Office of History, Corps of Engineers



The 1938 passage of the Civil Aeronautics Act, creating the Civil Aeronautics Authority, gave Roosevelt the power to authorize the planning and construction of the new airport.

America's first federally-owned commercial airport resulted from the close cooperation of five federal agencies and was largely funded through New Deal initiatives with 3,500 men from the Works Progress Administration providing much of the labor. The Corps' responsibilities were the survey, design, and preparation of the site that included building a levee around the airport's land reclaimed from the Potomac River. Gravelly Point was a low-lying area on the Potomac's west bank, already being enlarged by Corps

of Engineers dredging before the 1938 official approval of the site. It required extensive additional filling before construction could begin. The airport's original 729 acres included 500 that were landfill, brought up from the bottom of the Potomac by Corps of Engineers' dredges. This hydraulic fill construction was a complex problem involving settlement of the river bottom's highly compressible mud, the choice of suitable materials for the runways, and planning for drainage in case of floods. When the airport opened to traffic on June 16, 1941, it was state-of-the-art, with lighted runways to accommodate the heaviest



*By March 1940 dredging operations were almost completed under the direction of District Engineer Col. Thomas. The Corps paved the four runways seen in this upriver view, landscaped the site, and built hangars and administration buildings.*  
Office of History, Corps of Engineers

projected aircraft and the latest flight control and weather forecasting equipment. The airport project also required two miles of the new Mount Vernon Memorial Highway to be realigned.<sup>40</sup>

On September 28, 1940, President Roosevelt laid the cornerstone for the terminal building, designed by Howard L. Cheney of the Treasury Department's Procurement Division in its Office of Public Buildings (the successor to the Supervising Architect of the Treasury Department). Work crews under the superintendence of District Engineer Colonel Robert S. Thomas pumped 20 million cubic yards of fill behind dikes, and graded, landscaped, and paved the field, brought in water and sewage lines, and built hangars and administration buildings.<sup>41</sup>

## **FORT DRIVE**

Fort Drive had been included in the 1902 Senate Park Commission's report as part of Washington's park system, a parkway connecting the Civil War forts encircling the city to serve as a scenic, recreational drive. In 1919 Colonel Ridley submitted a report to Congress calling for Fort Drive and five years later Congress authorized a survey and study. In 1926 under Colonel Grant, a Fort Drive of about 23 miles in extent was one



*The shaded areas on the Engineer Commissioner's 1933 Map of the District's Permanent System of Highways indicate Fort Drive proposed by the National Capital Park and Planning Commission, a ring road that connected the Civil War forts along a scenic parkway.*

Library of Congress, Geography and Map Division,  
G3852 .F56 G45 1993 .U5

of the new National Capital Park and Planning Commission's major proposed projects. During the next two years the Engineer Commissioner approved the plan and in the early 1930s rights of way were acquired and the plan's design was refined. The Depression halted the project because funding was not available. In 1940 engineer Jay Downer proposed changing Fort Drive from a parkway to a freeway, the precursor of Washington's beltway. Although 98.9 percent of the rights of way were in hand by 1953, the freeway was not built because the new chairman of the National Capital Planning Commission had different priorities among many published in the agency's 1953 Comprehensive Plan. Engineer Commissioner Bernard L. Robinson calculated that the freeway was needed because of the volume of traffic at mid-century: 152,000 trips per day were made to the central business district, "while 122,500 trips with other destinations pass through the central area daily." Fort Drive as a "circumferential highway" would route traffic not destined for downtown Washington around the heart of the city.<sup>42</sup>

*Wartime Temporary Buildings on the Mall, 1943. From 1922 to 1940 the Corps of Engineers headquarters was located in the Munitions Building, the westernmost section of the World War I "temps" closest to the Lincoln Memorial. These buildings prevented completion of the Reflecting Pool's central cross arm. Temporary office buildings erected during World War II were located on the south side of the Reflecting Pool. The last of the "temps" was removed in 1967.*

*National Capital Planning Commission*



**PENTAGON**

For many years the U.S. Army had been looking for a location to construct a new central headquarters. It had considered sites around the city—near Walter Reed Hospital and adjacent to the Army War College—before developing a site in Foggy Bottom in 1938. By the middle of 1941 when this 500,000-square-foot building opened, the War Department employed 24,000 people, and they were scattered among seventeen buildings in the district and Virginia. The new headquarters was not even the department's largest building: the 779,000-square-foot Munitions Building, a World War I temporary structure on Constitution Avenue, had that honor. A 25 percent increase in War Department personnel was anticipated by the beginning of 1942, placing an incredible strain on already short supplies of office and storage space available to the department.<sup>43</sup>

In November 1940 the U.S. Army acquired a portion of the Agriculture Department's Government Experimental Farm between Arlington Cemetery and the Potomac, and when Congress appropriated funds for the War Department to construct additional temporary buildings in Washington, Army Chief of Staff General George C. Marshall preferred the more spacious and convenient site at the end of the Memorial Bridge. When planning on the Pentagon began, military construction was under the Quartermaster Corps. On December 1, 1941, President Roosevelt approved an order moving the construction function from the Quartermaster Corps to the Corps of Engineers. Thus, the engineers who began work on the Pentagon were detailed to the Quartermaster Corps until the end of 1941.<sup>44</sup>

The Quartermaster Corps' construction division chief, Brigadier General Brehon B. Somervell, thought a permanent building solution was needed. In the summer of 1941 Somervell, who was an engineer officer, proposed constructing a single permanent building housing forty thousand people to centralize the War Department's operations. Somervell charged Engineer Lieutenant Colonel Hugh J. Casey, chief of the Quartermaster Design Section, and architect George E. Bergstrom, president of the American Institute of Architects and chief consulting architect to the War Department, with designing such a structure. In one hectic weekend, they and their assistants sketched plans for a three-storied, five-sided structure capable of housing forty thousand workers. They sited it on the Arlington Farms land, the bordering roads of which dictated a five-sided design.

The House passed an appropriation to fund the 5.1 million square foot structure one week after Bergstrom and Casey first presented their design. Objections to the building's size, location, and cost delayed Senate approval by a month, but in the end the bill passed with no strings on the structure's site, size, or design.<sup>45</sup>

The Arlington Farms site formed a portion of the original Arlington estate, and it bordered Memorial Drive on the main approach to Arlington Cemetery. Among others, the prominent Frederic A. Delano, chairman of National Capital Park and Planning Commission, and Gilmore D. Clark, chairman of the Fine Arts Commission, objected that the massive new building would dominate the view to and from the cemetery, seriously compromising the dignity of the place. President Roosevelt first approved the site, and then rejected it based in large part on these two men's arguments. Over Somervell's strong objections, he ordered the War Department building built at an alternate site further south, partially on land purchased in July 1941 from the disused Washington-Hoover Airport. Roosevelt also ordered the building be scaled down to accommodate twenty thousand workers.<sup>46</sup>

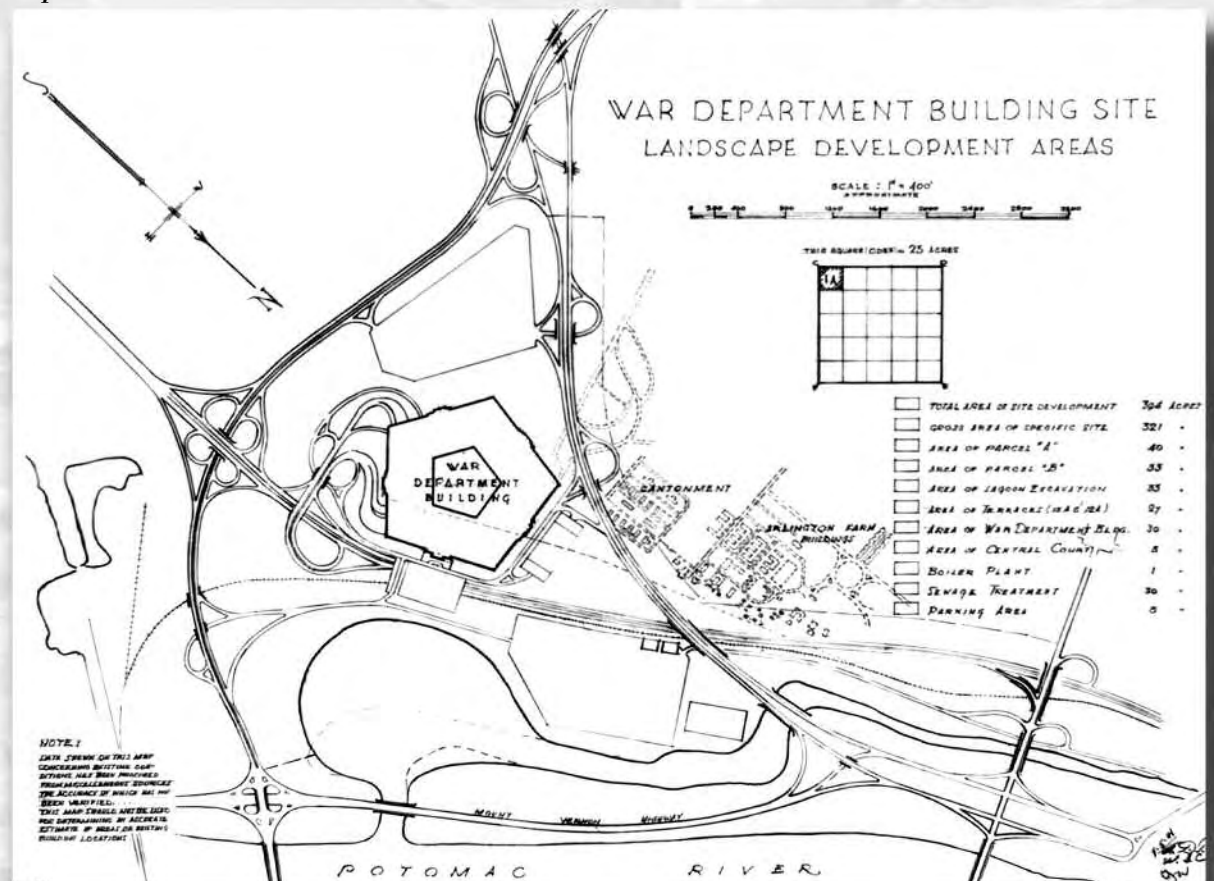
Redesigned to about four-fifths its original size, the structure's pentagon shape was retained for the new site. John McShain, Doyle & Russell, and Wise Contracting Co., were hired as builders, and extensive work was performed by more than two dozen subcontractors. George Bergstrom served as chief architect until his resignation in April 1942, when his assistant David J. Witmer replaced him. Both were California architects. Witmer served between 1934 and 1938 as chief architectural supervisor for the Federal Housing Administration in southern California. Bergstrom worked in Los Angeles in the 1920s. His firm, Allied Architects, designed the Hollywood Bowl and the Los Angeles County Museum of Science, History, and Art.<sup>47</sup> Their design staff at the Pentagon numbered, at its peak, 110 architects, 54 structural engineers, and 43 mechanical engineers, plus more than one hundred supervisory field architects and inspectors. First under the chief architect, the field workers were later placed under the direction of Arlington District Engineer Major Clarence Renshaw when responsibility for military construction in the War Department passed from the Quartermaster Corps to the Corps of Engineers. Renshaw also directed the contractors, mediating between McShain, the principal contractor, and the architects. General Somervell had final say on all aspects of the project, but gave Colonel Leslie R. Groves (later head of the Manhattan Engineer District) direct oversight.

Groundbreaking was September 11, 1941. The final design placed five concentric rings of offices, broken by light courts, around a central courtyard. Ten crossing wings connected the concentric rings, easing circulation through the building. With five floors, it was built of reinforced concrete mixed on site from sand and gravel dredged out of the Potomac. Its outside perimeter walls were faced in limestone. Efforts to reduce the use of steel in the building led to extensive use of wood, fiber, and concrete in partitions, ducts,

## RAPID RISE OF THE PENTAGON

From conception after July 17, 1941, to completion on January 15, 1943, the Pentagon was a remarkable design and construction feat. Built to conserve scarce wartime materials and with little superfluous ornamentation, it was a utilitarian office building bigger than any other in the United States at the time. The period from groundbreaking on September 11, 1941, to the arrival of the first occupants on April 29, 1942, was an incredible seven months. The Pentagon greatly reduced, although did not eliminate, the War and Navy Departments' demand for office space in Washington, although it seemed then far from downtown. It was constructed sturdily enough for records storage after the war in case its services would no longer be required.

September 1941



January 1942





*July 1942*



*n.d.*



*July 1947*

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*“The shortness of time from commencement of the building to completion is quite as much due to his driving force and his determination to remove causes of hindrance as [to] the cooperation and efforts of all parties engaged in the work.”*

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and drains, plus the addition of pedestrian ramps between floors to reduce the number of elevators. Provision was made in the Pentagon design for efficient bus, truck, and fire equipment access. Sections of the building were occupied as they were completed, and construction focused on a fifth of the building at a time. The first 300 employees moved in at the end of April 1942, and by the end of May, one million square feet of office space was ready. Twenty-two thousand people worked at the Pentagon by the end of December. Construction finished January 15, 1943, two months after the original completion goal.

The Pentagon construction required architects to lay out more than thirty miles of access roads, greatly accelerating long-term National Capital Park and Planning Commission plans for improving the approaches to Memorial Bridge and the Highway Bridge. They built two giant parking lots, seeded twenty acres of lawn, and landscaped much of the remaining 530 acres that originally surrounded the building. The building required a dedicated heating and cooling plant and a sewage treatment facility that also handled waste from other government buildings in the area.

The creation of the Pentagon, figuring out its many details, and time and material savings ideas, resulted from a dynamic process continuously negotiated between the builders; Renshaw, with the review of his superiors; and the architects. An assessment written in 1942 directly credited now Lieutenant Colonel Renshaw “for the early completion of the building. He alone could represent the War Department, make decisions in the interest of speeding the work and direct the design office, the builder and the inspection force to the end that the work should be accomplished as speedily as possible. The shortness of time from commencement of the building to completion is quite as much due to his driving force and his determination to remove causes of hindrance as [to] the cooperation and efforts of all parties engaged in the work.”<sup>48</sup>

But unceasing demands for speed helped create a high on-the-job accident rate, while cost overruns drew criticism from the press and congressional investigators. The sheer size of the Pentagon and the notion that the military was feathering a plush nest for itself at taxpayers’ expense drew frequent barbs. Washington wags laughed at the remoteness of the structure, separated by the Potomac from the shopping and dining facilities of downtown.<sup>49</sup>

## WORLD WAR II IN WASHINGTON

On December 1, 1941, the engineers took over the construction responsibilities of the Quartermaster Corps, including Bolling Field, now a 600-acre base. Until the end of the war Colonels William J. Barden (who returned to active duty from retirement), Clarence



Renshaw, and John M. Johnson of the Washington Engineer District directed the building of runways and mess halls, laboratories and boiler plants, a broadcasting studio, electrical and sewage systems, and family housing and recreational facilities. Under district supervision the Public Works Administration built an eight-mile highway, now Suitland Parkway, to connect Bolling to Camp Springs Army Air Field (later Andrews Air Force Base). The district also worked to keep ground transport moving, building between 1942 and 1946 an emergency railroad bridge across the Potomac and four temporary highway bridges—one at 14th Street, two at Roosevelt Island, and one across the Anacostia near the Navy Yard. In 1942 the district also took over construction work at Walter Reed Army Medical Center, where it built laboratories, wards, a gymnasium, and a pool.<sup>50</sup>

In 1944 General Grant proposed a “National Capital Stadium” located on East Capitol Street where it joins the Anacostia River to serve as a “useful memorial” to honor the nation’s military heroes as well as to function as an impressive gateway to the city from the

*The Washington Engineer District supervised construction of what became known as the Suitland Parkway to allow rapid travel between Bolling Army Airfield and the Camp Springs Army Airfield (later Andrews Air Force Base). The district completed the parkway, seen here in 1949, in late 1944.*

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*(Top)*  
*Emergency Railroad Bridge, August 1942. The Washington Engineer District built this additional, temporary crossing over the Potomac River from Shepherds Landing, D.C., to Alexandria, Virginia, to transport goods and troops in a national emergency. Authorities worried that the bridge immediately to the north was the only rail crossing of the southern Potomac River.*  
*National Archives no. 77-RH-141B-1*

*(Bottom)*  
*The Washington Engineer District also built four lighter emergency highway bridges, three across the Potomac River and one spanning the Anacostia River. This one connecting Constitution Avenue near the Lincoln Memorial to Roosevelt Island was photographed in August 1942.*  
*National Archives no. 77-RH-141-B-7*



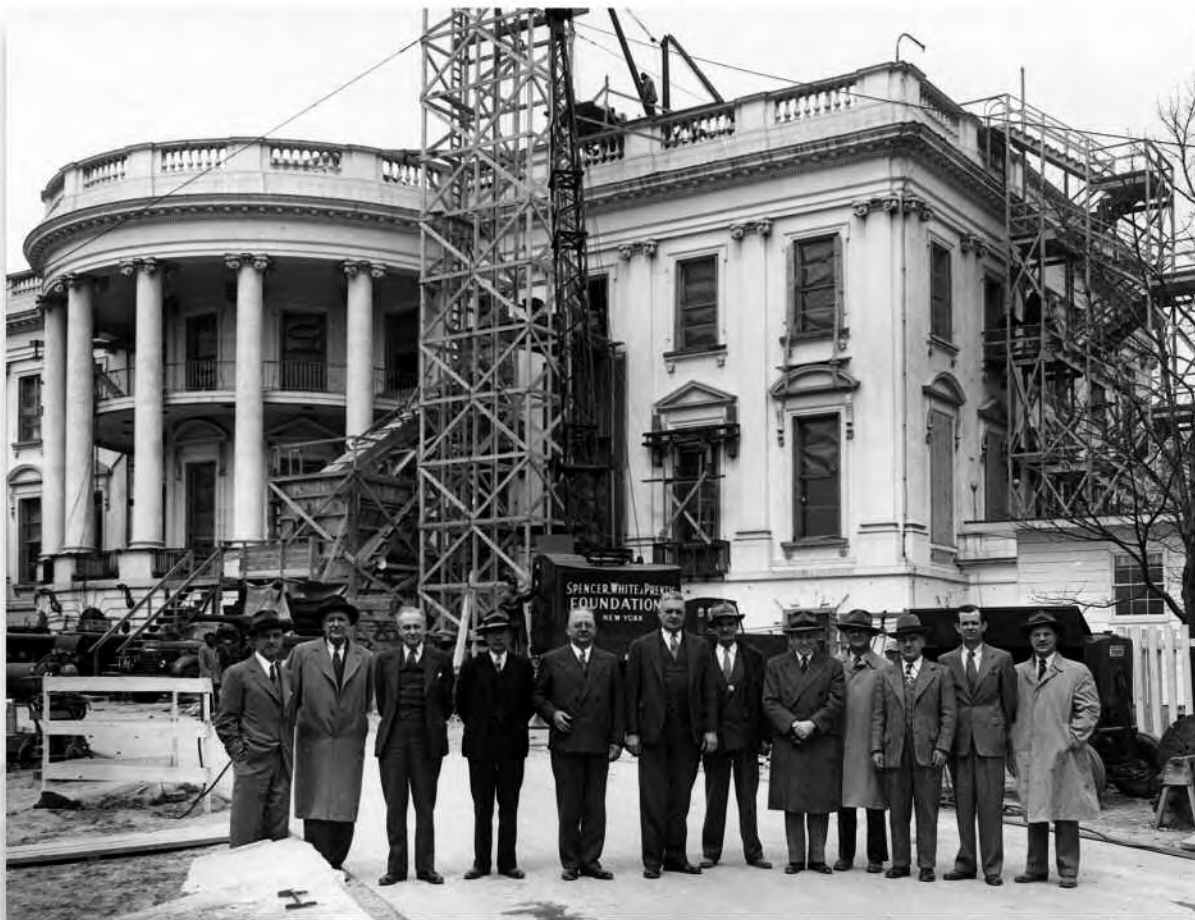
east. Working with city planner John Nolan, Grant proposed a hippodrome-shaped stadium on the north side of East Capitol Street and a monumental parade ground overlooked by a grandstand on axis with the street. As was his practice, Grant invited all concerned citizens to attend a mass meeting about a project that he fostered for a decade. Grant's many civic contributions to Washington included frequent lectures before neighborhood associations and historical organizations. He served as president of the Columbia Historical Society from 1952 to 1968. It was through his efforts from 1954 to 1957 that the Christian Heurich mansion was secured as the society's headquarters.<sup>51</sup>

### TRUMAN WHITE HOUSE

During the first three years of his presidency, Harry S Truman and his family were frequently bothered by creaking noises, drafts, cracking plaster, and unusual floor movements in the White House. Studies in 1948 determined that years of use and modification had seriously weakened the White House's structure, making it unsafe for the number of visitors it often contained. Deciding to save what he could, Truman asked Congress for \$5.4 million to completely rebuild the White House within its original walls.<sup>52</sup>

In April 1949 Congress created the presidentially appointed Commission on the Renovation of the Executive Mansion. It worked with the Public Buildings Service, the General Services Administration, and architect Lorenzo Winslow. Consulting on the project were architect William Adams Delano and civil engineers Ernest Howard and Emil H. Praeger. In the middle of it all was the commission's executive director, retired engineer officer Major General Glen E. Edgerton, and his assistant, Colonel Douglas H. Gillette of the Corps of Engineers.

The Commissioner of Public Buildings handled the contracting, but the Commission on the Renovation acted as the controlling body guiding the entire project. Throughout, Truman exerted direct influence over the commission and the architects. After the president's household moved across the street to Blair House in 1948, it took a year of planning before demolition began. In 1950 the original interior was dismantled to allow for the excavation of new foundations and sub-basements and the erection of a steel structure and concrete floors. Installing modern utilities and duplicating the interiors took until March 1952. This renovation of the White House was at the vanguard of the new profession of historic preservation and the entire team formulated principles of how to conserve historic properties as they faced the challenges of a major construction project that had to be invisible when completed. The public expected the White House to be aesthetically and



*April 1950*



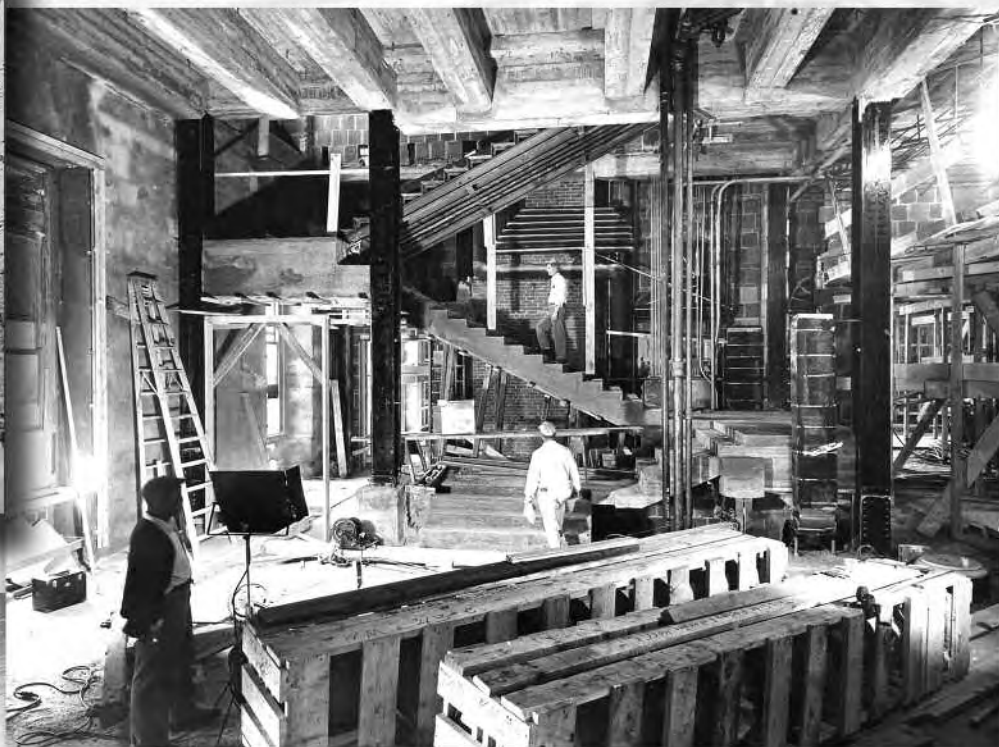
*May 1950*

#### **WHITE HOUSE RENOVATION**

President Harry Truman sponsored the most extensive “renovation” of the White House between 1948 and 1952 since its original construction in the 1790s. In reality, only the original exterior walls and some paneling from Theodore Roosevelt’s 1902 renovation survived. Yet, conserving both the original plan with its famous East Room, Blue Room, and State Dining Room and the exterior appearance approved by George Washington was critical to the preservation strategy. Truman worked closely with Maj. Gen.(Ret.) Glen Edgerton to retain the White House’s national symbolic meaning yet create a functional, up-to-date residence.



*July 1950*



*June 1951*

*November 1951*

symbolically the same but the Executive Branch required a safe home for the president with sufficiently modern service facilities for large-scale entertaining and adequate office space for a large staff. These multiple needs were met by underpinning the original walls and excavating beneath the original footprint as well as along its perimeter to construct multiple basement levels and tunnels connected to the executive office buildings. Steel frames were inserted in original exterior walls while an entirely new steel structural system was built to receive the original interior walls that were saved. Because the underground construction proved to be more time-consuming than anticipated, the interiors had to be hastily built and they were erected with new materials.<sup>53</sup>

During the course of the work, a detailed diary of the renovation was maintained at the direction of General Edgerton. It recorded all daily activities on site from October 28, 1949, to March 27, 1952, including this entry for March 3, 1952: “Capital Parks grading and tearing down shacks. Plasterer patching in misc. locations. make inspection of cabinets in pantries and kitchen and tell Jamestown man what to do in way of corrections. Meeting in General Edgerton’s office. Matter of ice cream maker comes up and Mr. Crim says it must be installed. Matter of oiling soapstone in fireplaces discussed.” Truly, the daily duties of Corps engineers were a constant round of trivial details and momentous decisions.<sup>54</sup>

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*“Meeting in General Edgerton’s office. Matter of ice cream maker comes up and Mr. Crim says it must be installed.”*

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The Truman renovation preserved the original exterior stone walls designed by Hoban, but tons of wood, brick, and plaster became landfill at Fort Myer, Virginia. Although the architects made detailed plans to reuse original woodwork and ornamental plaster, little was reused because of damage, time pressures, and cost cutting. The State Dining Room dating from Theodore Roosevelt’s 1902 White House renovation, its oak paneling painted light green, was the only room substantially reinstalled with pre-renovation materials.

After the excitement of building structures associated with the great era of monumental Washington was over about 1920, Corps members spent much of the first half of the twentieth century devising and implementing modern civic infrastructures as important as the engineering and architectural ones that occupied their predecessors. They brought to this essentially political and bureaucratic work the same creative energies that others expended on building bridges and raising complex and impressive monuments. Moreover, the commitment of many Corps members went far beyond completing their assigned jobs expeditiously but extended to their life as Washington citizens. Kutz, who graduated second in West Point’s 1893 class, served his third term as Engineer Commissioner from 1941 to 1945 as a retired general called back to public service. Grant was away from

Washington from 1933, the year the responsibilities of the Office of Public Buildings and Grounds were transferred to the National Park Service, until 1942. When he returned, Grant took over the chairmanship of the National Capital Park and Planning Commission and expanded his civic service to membership on several public and private commissions for the preservation of Washington's and the nation's historic heritage. He was one of the first ten trustees of the National Trust for Historic Preservation, created by Congress in 1949, for example. The allegiance of such men to their profession was matched by their commitment to the nation's capital.<sup>55</sup>



**THE CONNECTICUT AVENUE BRIDGE (1897—1907) SPANNING THE ROCK CREEK VALLEY WAS DESIGNED BY GEORGE S. MORISON AND EDWARD P. CASEY UNDER THE SUPERVISION OF ENGINEER WALTER J.**

**DOUGLAS OF THE BRIDGE DIVISION IN THE OFFICE OF THE DISTRICT COMMISSIONERS. EACH OF ITS SEVEN ARCHES IS BUILT OF PRE-CAST AND POURED CONCRETE, ONE OF THE EARLIEST AND LARGEST CONCRETE BRIDGES IN THE WORLD THAT DOES NOT DEPEND ON METAL REINFORCEMENT; RATHER, THE SPANDRELS OF EACH ARCH ARE COMPOSED OF A SERIES OF ARCHES. ORIGINALLY CALLED THE MILLION DOLLAR BRIDGE (ACTUAL ESTIMATED COST \$846,331), IT WAS RENAMED THE WILLIAM H. TAFT MEMORIAL BRIDGE IN 1931. THE 1891 STEEL TRUSS CALVERT STREET BRIDGE THAT CROSSES THE NORTH LANDFALL OF THE TAFT BRIDGE WAS REPLACED IN 1935 BY ONE DESIGNED BY PAUL CRET, RENAMED THE DUKE ELLINGTON MEMORIAL BRIDGE IN 1974.**



**THE FOOT OF 11TH STREET, SE, HAS BEEN THE LANDFALL OF SEVERAL ANACOSTIA RIVER BRIDGES BUILT TO SERVE THE NAVY YARD. ENGINEER DOUGLAS REPLACED AN 1875 IRON BRIDGE WITH THE STEEL ARCH 11TH STREET BRIDGE (1905-07) THAT INCORPORATED**

**A COUNTERWEIGHTED DOUBLE BASCULE SPAN AND CARRIED DOUBLE STREETCAR TRACKS AS WELL AS ITS ROADWAY AND SIDEWALKS. BY 1970 TWIN PARALLEL STEEL GIRDER BRIDGES SPANNING THE ANACOSTIA WERE LINKED MORE TO THE AREA'S REGIONAL HIGHWAY SYSTEM THAN TO WASHINGTON'S STREETS.**



**ENGINEERS MODJESKI AND MASTERS AND CONSULTING ARCHITECT PAUL CRET WON THE LIMITED DESIGN COMPETITION FOR THE PRESENT SOUTH CAPITOL STREET BRIDGE IN 1942, BUT WORLD WAR II DELAYED ITS CONSTRUCTION UNTIL 1949. THE RIVER'S ANGLE AND THE POSITION OF THE ANACOSTIA SHORELINE REQUIRED THAT THE BRIDGE DEVIATE FROM THE TRUE NORTH-SOUTH AXIS OF SOUTH CAPITOL STREET. BECAUSE IT SEPARATED TWO INDUSTRIAL PARTS OF THE CITY, THE BRIDGE NEEDED A 386-FOOT-LONG SWING SPAN TO ALLOW A FORTY-FIVE-FOOT VERTICAL CLEARANCE FOR LARGE SHIPS TO PASS UPRIVER. IN 1965 THE SOUTH CAPITOL STREET BRIDGE WAS DEDICATED TO FREDERICK DOUGLASS, WHOSE CEDAR HILL HOME IS LOCATED NEAR THE BRIDGE'S ANACOSTIA LANDFALL.**